


## Technical Support

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Technical help is available: Monday - Friday from 07:00 - 19:00 (GMT)  
Saturday from 09:00 - 13:00 (GMT)

Documentation on all Paxton products can be found on our website - <http://www.paxton.co.uk/>

## What is a long range reader?

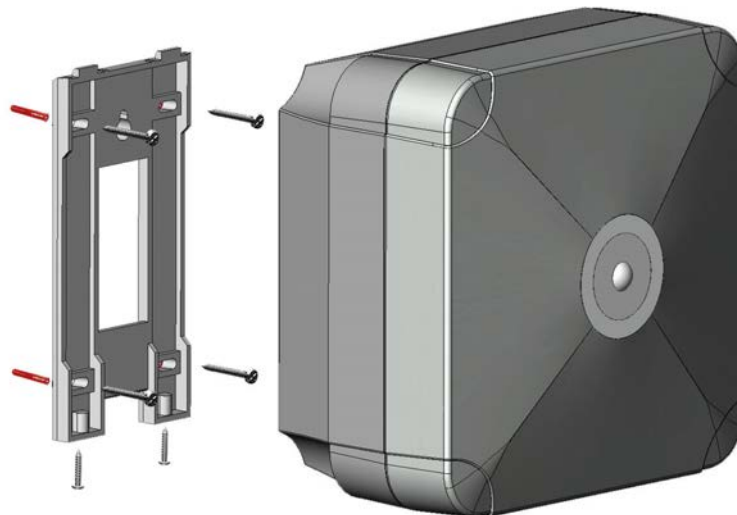
A long range reader can read Paxton hands free tokens up to a maximum of 5 metres. The system comprises of a long range reader with an integral hands free interface and hands free tokens (keycard or keyfob). The system operates by using the field being transmitted by the reader to wake up the token which then communicates with the interface.

Existing Switch2 or Net2 control units, can be used without modification. Standard Paxton tokens/keyfobs can be used with this reader but at their normal read range (see table on back page)

Hands free tokens also include a standard proximity ID chip and can therefore be presented to any Paxton proximity reader whether they are using the hands free interface or not.

Hands free tokens have features to maximise battery life. These include a two second timeout following a valid read and a block on repeated reads at the same door whilst the keyfob remains in range.

## Layout



## LED indications

The unit has a single high intensity LED array that displays RED or GREEN indications.

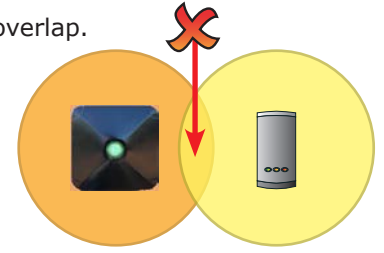
Steady RED - Waiting for card ( IDLE state )  
Flashing GREEN - Access Granted ( or held unlocked )  
Flashing RED - User Access Denied

If an error condition exists ( ACU powered off, Cable break, etc ) the LED will show a steady GREEN indication.

## Positioning readers

Hands free readers should be positioned so that their transmission fields do not overlap. (see table on back page for typical hands free ranges)

For optimum keyfob battery life please choose your reader location carefully to avoid placing it within hands free range of work stations, rest or smoking areas.



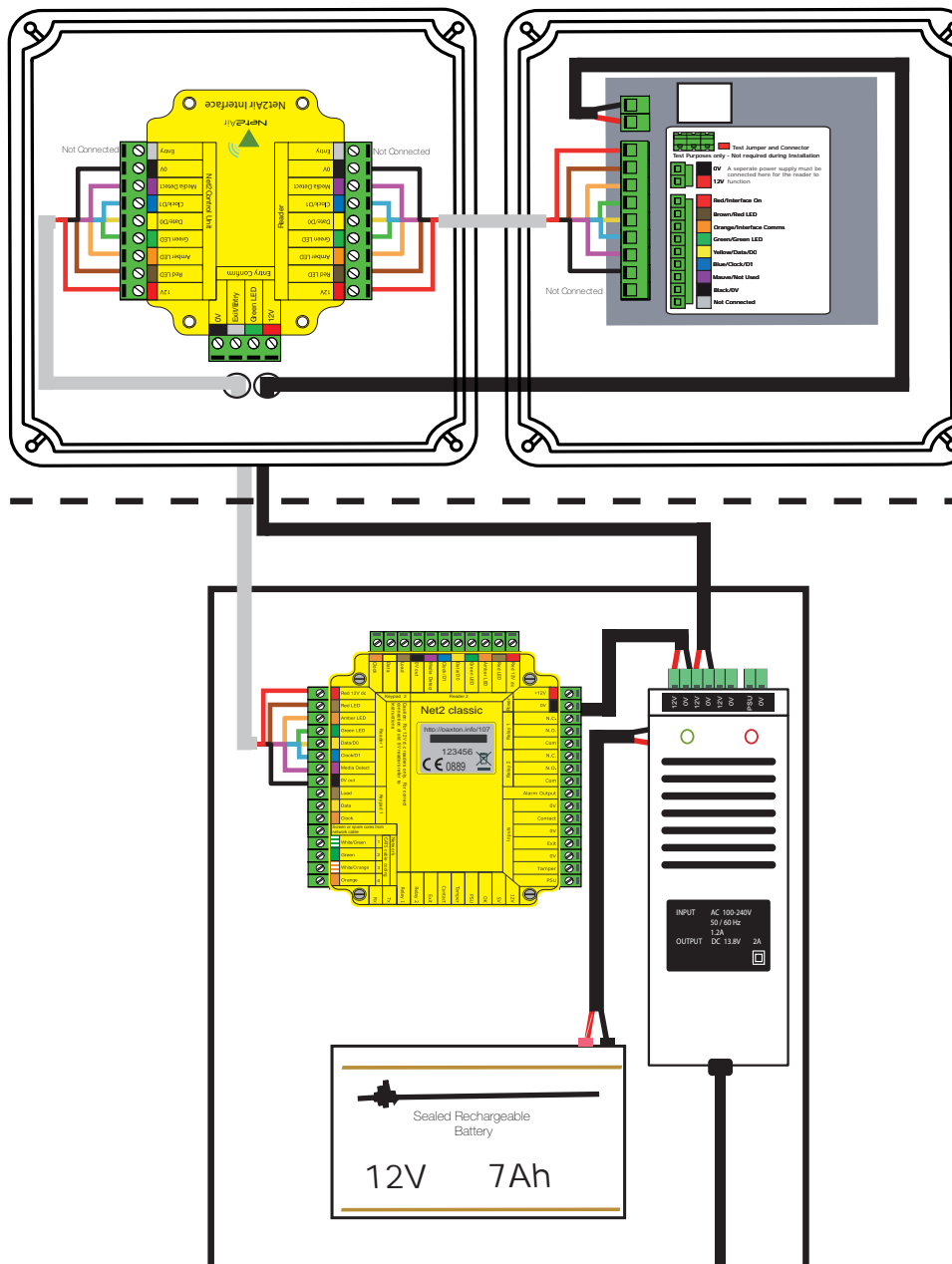
## Read in, read out

When using in and out readers, users may be picked up by both readers as they move through the door which will reduce the reliability of any roll call or anti-passback application. Ensure that sufficient spacing is provided between these readers for optimum range and reliability.

## Wiring

Interface Module

Reader Module



You will see that the interface is mounted upside down in the housing. This is to position the internal aerial away from other reader components and is intentional.

A data cable must be run from the control unit to the reader interface. The recommended cable for this is Belden 9540; a 10 core overall screened cable with a maximum length of 100 metres. Spare cores should be used to double up on the power wires (Red/Black) to the interface.

The reader requires a higher current (up to 1A) than can be supplied by the ACU reader port and so an independent 12V DC power feed must be provided. As per the wiring diagram, the spare outputs on the Paxton 2A boxed power supply can be used for this purpose.

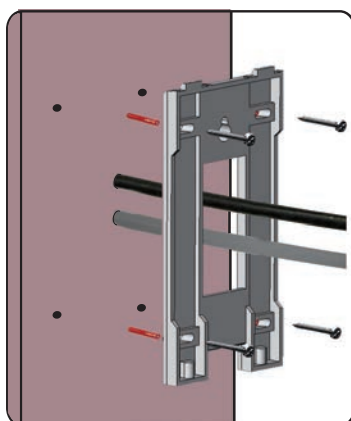
It is important to run an appropriate power cable to the reader that is capable of carrying a current of 1A.

A 5 metre length of 0.75 mm sq x 2 core cable is supplied with the reader. For longer runs it will be necessary to increase the size of the cable as any voltage drop will reduce the read range. We recommend a cable of 2.5 mm sq x 2 core cable for distances up to 100 m.

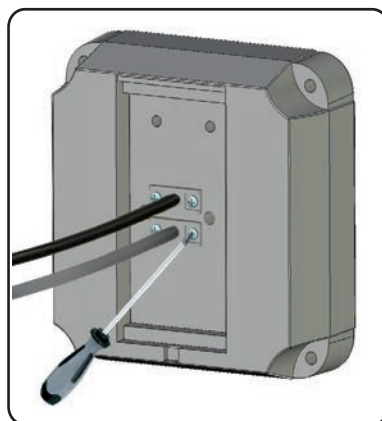
## Fitting

The long range reader consists of a reader module mounted inside the front half of the housing and a hands free interface mounted inside the rear half. An interconnect cable is supplied that connects the two sections together.

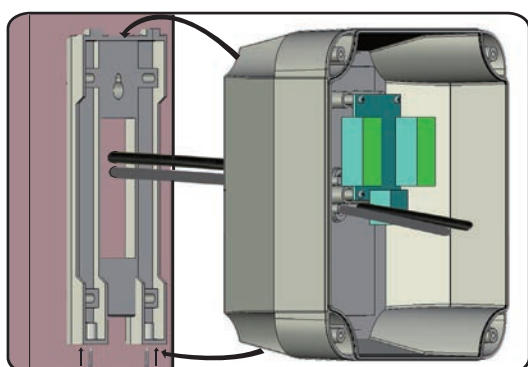
Two 5 metre cables for data and power are provided. These enter the module at the rear through two compression glands. If longer cables are required, refer to the previous section for further details.



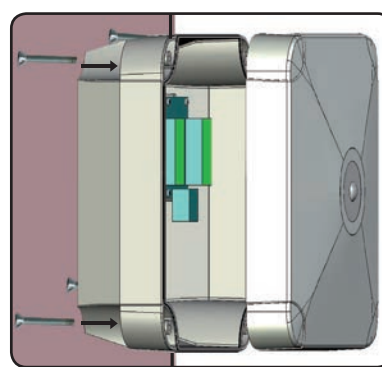
1



2



3



4

Determine the position of the reader and mark and drill holes for the fixing screws and cable access. Fix the mounting plate to the post with the locating hooks at the top. (Fig 1)

Feed the cables for power and data through the mounting plate and into the rear section of the reader leaving enough slack to allow easy connection to the circuit boards later in the installation.

Tighten the weatherproof cable glands at the rear of the reader. (Fig 2)

Hang the rear reader section on the mounting plate and secure with two screws. (Fig 3)

Complete the wiring of the reader as shown in this instruction.

Join the front section to the rear section with the Allen screws provided. (Fig 4)

It may be necessary to briefly remove the reader from its mounting plate if access to the Allen screws is limited by the post or wall.

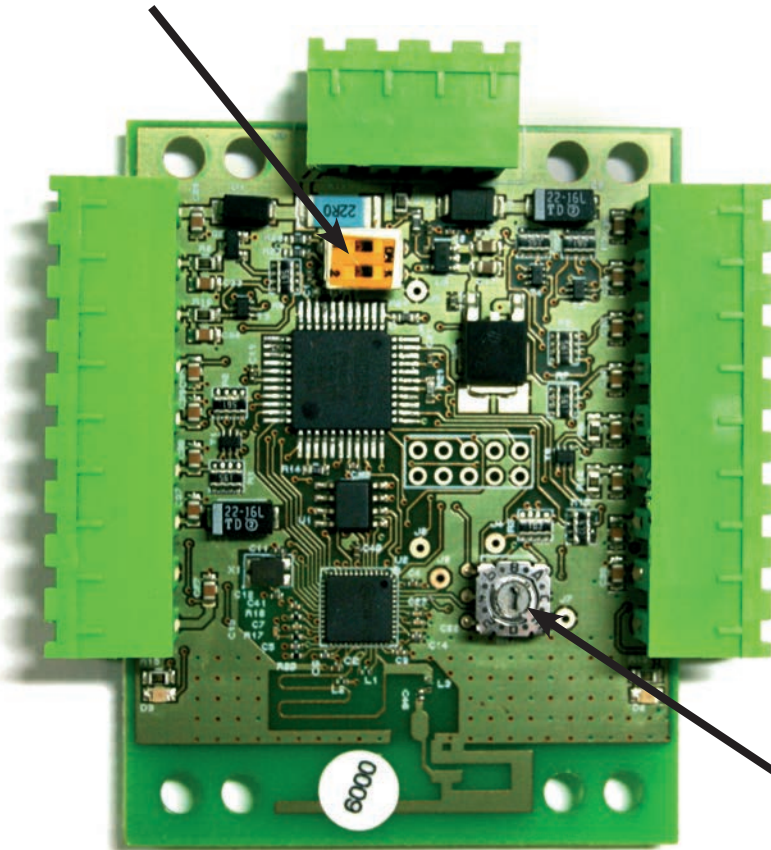
## Changing frequency channel

If you are experiencing problems with the range or reliability this may be due to poor reader positioning, adjacent interfering 125 kHz or 2.4 GHz equipment, e.g. an adjacent wireless PC network. Please refer to the 'Before you install' information regarding unit locations.

If you are still unable to improve the system performance then you may try an alternative 2.4 GHz channel using Switch 1. The system has 16 channels available. (Unless keycard SW2 is selected) The frequency switch is set to 4 (channel 15) but this can be changed using a small flat blade screwdriver. Take care not to contact the circuit board with the screwdriver blade as this may damage components. Power cycle the unit after any changes.

The hands free tokens will automatically configure themselves to use the new channel.

SW2 - Keycard button 1 and 2 fixed channels - If either switch 1 (Channel 26) or switch 2 (Channel 11) is set, the rotary frequency switch is disabled. If both switches are selected, the interface will not operate.



**Interface PCB**

Switch position	GHz	IEEE 802.15.4 channel
0	2.405	11
1	2.41	12
2	2.415	13
3	2.42	14
4	2.425	15
5	2.43	16
6	2.435	17
7	2.44	18
8	2.445	19
9	2.45	20
A	2.455	21
B	2.46	22
C	2.465	23
D	2.47	24
E	2.475	25
F	2.48	26

SW1. Rotate the switch to select an alternate channel.

The switch will initially be set to default position '4'

## Enrolling hand free keyfobs and keycards

### Hands free keyfobs

These tokens should be assigned to users as per standard keyfobs. They will then operate with standard Paxton readers or via a hand free setup when in range.

### Hands free keycards

Keycards should first be assigned to users as per the hands free keyfob.

To enable the buttons, the keycard must first be presented to the P series reader and then used in hands free mode. The keycard stores the details of this interface and can then activate the door using a button.

A keycard can be used in normal hands free mode and also in local passive mode with other Paxton readers.

Switch SW2 is used to select the fixed channels used by the two keycard buttons. Select either switch 1 or 2 to set which keycard button the interface will respond to.

The unit must be power cycled if the switch position is changed to activate the new setting.

## Technical Help

Here is the list of topics about this product that receive the most technical support enquiries. We list them here to help you speed up the installation and trouble shooting process.

### 1 - Hands Free - The read range is very poor - Where is the best position for the reader?

The wireless signal will not travel through metal or water and will be influenced by building features and other 2.4 GHz wireless sources, including WiFi networks and DECT phones. The ideal location is to provide a 'line of sight' to approaching card users. Avoid putting the reader where metal objects, (e.g. wire fences, vehicles, etc.) can block the signal.

When attaching to a post, a high position (> 1 metre) is desirable to provide a clear signal path through the vehicle glass from the keycard/fob to the reader.

See also: [AN1091 - How to achieve the best read range with hands free equipment](#) < <http://paxton.info/867> >

### 2 - Keycards - Can I improve the read range on curved driveways?

It is possible to use two or more readers on the same ACU reader port, increasing the coverage area. (See AN1091 as above) The keycard will choose the best one to communicate with each time it is used.

### 3 - How do I set up the Keycard Buttons?

The keycard must first be read in hands free mode by the interface without pressing any buttons. Ensure that no other hands free devices are in the range of the reader. If the card does not enrol, come out of the reader range for at least 2 seconds. The keycard has two buttons - each can store multiple interface addresses in its memory.

### 4 - Hands Free - Keycard button problems - Correct practice for using the keycards:

- Press button firmly once - Do not press the button again within 2 seconds - Avoid multiple button presses in succession as this may overrun the output buffer of the interface locking it for 10 seconds.
- Point the Keycard in the direction of the interface - Avoid pressing a button when not in line of sight with the interface. Ensure switch SW2 on the Hands Free Interface is set to the correct position for the button being used (1 or 2)

### 5 - Net2Air - What does this mean?

Net2Air is a term used to describe the wireless communication protocol used by Paxton products in much the same way as Bluetooth. Only Paxton products can use this secure closed technology.


The Net2Air protocol is based on the Institute of Electrical and Electronic Engineers (IEEE) standard known as IEEE 802.15.4. It operates at 2.4 GHz and can co-exist with wireless LAN networks and other devices using this frequency such as DECT phones. All Paxton products employ AES128 encryption technology to ensure that all communication remains secure.


### 6 - If you power cycle the reader, the hands free token does not always read.


Hands free tokens have features to extend battery life. These include a block on repeated reads at the same door whilst the keyfob remains in range. If the token is read at power up, it must be moved out of range before it will be read again.

## Suitability

Security-sensitive doors 

Compatible with hands free tokens 

Wet environments 

Compatible with non-hands free tokens 

## Using an entry confirm button

Where more than one door interface can pick up the hands free token, a 'push to make' button can be used to select the required door. Where fitted, the LED on a confirm button will flash for 5 seconds after the hands free token has been recognised and must be pressed to unlock the door.

Once an entry confirm button has been fitted to the interface PCB, perform the following sequence:

1. Power down the interface board.
2. Power up the interface board.
3. Press and hold the entry confirm button for a minimum of 3 seconds within 60 seconds of power up.

To disable the use of the button, repeat the above sequence.

## Specifications

Electrical	Min	Max	
Voltage - Reader module	11V DC	14V DC	
Current - Reader module		1 A	
Voltage - Interface module	11V DC	14V DC	
Current - Interface module		80 mA	
Additional power supply required			Yes
Carrier frequency	119 kHz	140 kHz	
	2.405 GHz	2.480 GHz	
Clock and data bit period			600 µs
Cable type for extensions			Belden 9540
Cable length between ACU and reader		100 m	
12V Power cable core diameter - up to 5 m run	0.75 mm sq		
12V Power cable core diameter - up to 100 m run	2.5 mm sq		
Button confirmation input			Yes
<b>Read range with passive tokens</b>	Token	Keyfob	Watchprox
Long range reader	80 mm	40 mm	10 mm
<b>Read range with hands free token</b>	Min	Max	
Long range reader		5000 mm	
P200E metal mount		2000 mm	
P200		2500 mm	
P75		1500 mm	
P50		1100 mm	
P38		850 mm	
<b>Environment</b>	Min	Max	
Operating temperature	- 35 °C	+ 66 °C	
Waterproof	IP66		Outdoor use
<b>Dimensions</b>	Width	Height	Depth
	220 mm	220 mm	135 mm

**CE0889!**

The declaration of conformity is available on request. Contact details are provided at: <http://paxton.info/596>

Paxton Access Ltd hereby declares that this product is in conformity with all the essential requirements of Directive 1999/5/EC. This equipment is intended for use in all EU and EFTA countries and all other countries worldwide.